

method of representing dispersion on the electromagnetic theory, as due to the presence in the medium of electrical resonators, is capable also of explaining the gradual extinction found to take place as due to radiation from the resonators. He comes to the conclusion that it is not, and in this respect is in opposition to Prof. Planck, to whom the theory of dispersion owes so much.

THE concluding fascicule of the *Bulletin des Séances* of the Société française de Physique for the year 1907, which has just been issued, contains a valuable résumé of the communications made to the society during the past year. It occupies eighty pages, and is of the greatest service to those who have not the time to read the complete papers. A glance at the titles of the abstracts is sufficient to show that the Société française de Physique maintains its position as one of the most successful of the societies which receives and publishes original work done in the field of physics.

MANY geographical works, offered at greatly reduced prices, are included in a catalogue of publishers' remainders just issued by Mr. H. J. Glaisher, Wigmore Street, London, W.

AN admirable summary of the mineral resources of Western Australia is given by the Agent-General, the Hon. C. H. Rason, in the May number of the *Empire Review*. The twenty-three years' mining history of the colony proves it to be one of the richest mineral territories in the world.

AN illustrated itinerary of pleasure cruises to the Norwegian fiords by the yachting steamer *Midnight Sun* has been received from the Albion Steamship Co., Ltd., Newcastle-upon-Tyne. Each cruise extends over fourteen days, and the minimum fare is ten guineas. The sailings commence on June 6.

A USEFUL catalogue of electrical measuring instruments for technical and laboratory purposes has just been issued by Messrs. Isenthal and Co., Mortimer Street, London, W. Particulars and illustrations are given of electro-magnetic, moving-coil, hot-wire, and switchboard instruments of special types, and also of aperiodic precision instruments on the dynamometer principle, and insulation testers. The catalogue makes the selection of a suitable instrument of any of these designs a simple matter.

MESSRS. MARION AND CO., LTD., of Soho Square, London, announce a prize competition in which money prizes are offered for photographic work done on their plates, films, and printing papers during the present season. Of the four classes into which the competition is divided, one is for photographs of scientific interest. Biological, geological, astronomical, and natural history photographs, spectroscopic work, and photomicrography serve to indicate the general character of this class, though other scientific subjects are eligible. The first, second, and third prizes in this class are, respectively, 10*l.*, 5*l.*, and 2*l.*, and Mr. Chapman Jones will be the judge.

THE recent removal of Swedenborg's body from London to Stockholm, after it had reposed in the Swedish Lutheran Church in London for one hundred and thirty-six years, is a part of a larger movement for the recognition of the genius of Swedenborg in the domain of science. The movement began outside Sweden. Dr. Max Neuberger, of Vienna, in 1901 delivered an address before the assembly of German Naturalists and Physicians entitled "Swedenborg's References to the Physiology of the Brain." Following up this interest, Dr. Neuberger addressed a communication to the Academy of Sciences of Stockholm

in which he expressed his regret that Swedenborg's extensive manuscript on the brain, which is preserved in the library of the Academy of Sciences, had not yet been published. This led to the appointment of a committee to investigate the matter. Prof. Gustaf Retzius, the chairman of the committee and president of the academy, made a study of the subject of Swedenborg's physiological treatises. He became so impressed with the value of these works that he proposed to the academy to issue an edition of Swedenborg's scientific and philosophical works, and offered to bear the expense of the first three volumes himself. Several volumes of these and other of Swedenborg's works have already been published. The examination of Swedenborg's manuscripts is leading to the conclusion that theories and facts in many branches of science usually assigned to much later dates and to other men of science are becoming recognised as largely the work of Swedenborg.

OUR ASTRONOMICAL COLUMN.

A BRILLIANT METEOR.—A meteor of extraordinary brightness was seen by several observers at 9.45 on Sunday evening, May 17. Mr. T. F. Connolly, of the Solar Physics Observatory, observed the object from Wimbledon Common. It apparently commenced its flight about half a degree east of Polaris, and, travelling slowly to the east of north, passed about half-way between δ and γ Cassiopeiae. The brightness of the meteor exceeded that of Venus, which was above the horizon, and the head was pear-shaped. The duration of the flight was between three and four seconds; no trail was observed, and the meteor disappeared when at some twelve degrees above the horizon. This object was independently observed by Mr. H. E. Goodson, who states that it was one of the brightest he has ever seen. Mr. P. W. Copeland also writes to say that he observed the meteor at Belper, Derby, at the same time. He says:—"The meteor was of the slow-moving type, and I estimated its apparent diameter as from two to three times that of Venus at the present time. Just before the end of its path, a smaller portion, apparently at a lower temperature, separated and dropped in a more vertical direction. This observation has been confirmed by a friend who saw the meteor at Derby, eight miles from Belper."

CORRELATION OF STELLAR CHARACTERS.—A second paper by Miss Gibson and Prof. Karl Pearson on the correlation of stellar characters appears in the Monthly Notices (R.A.S.) for May (vol. lxviii., No. 5, p. 415). The characters of which the correlations have been examined in this paper are magnitude, colour, spectral class, proper motion, parallax, and position, all of which are of fundamental importance in any study of cosmical structure. As might be expected, there is found to be a marked relationship between the colours and the spectral classes of the stars considered, whilst the relation between magnitude and spectral class is but about half so marked; the latter is sensibly increased if the temperature classification of Sir Norman Lockyer be taken as the index of spectral class. The type of spectrum is also shown to be definitely associated with proper motion and parallax. It follows that, judging from the Yale parallax stars considered, there is a sensible correlation between chemical constitution and motion in space. Among the numerous other results obtained by Prof. Pearson we may mention that he confirms Prof. Newcomb's deduction that the mean parallax of an array of stars of given proper motion is one-fifteenth of that proper motion.

VARIABLE STAR WORK AT THE LAWS OBSERVATORY, MISSOURI.—Bulletin No. 13 of the Laws Observatory, University of Missouri, contains brief descriptions of the Zöllner-Müller photometer and the Gans-Crawford telescope recently acquired by the observatory for use in the series of photometric observations being carried out there. The results of numerous observations and revised elements and light-curves are also published for the variable stars X and V Lacertæ. Bulletin No. 14, from the same source,

discusses 160 observations of the peculiar variable RV Tauri (45, 1905). The light-curve of this object is of the β Lyrae type, and the maxima and secondary minima present variations in amplitude which appear to be irregular. Between November, 1904, and July, 1905, the character of the variation seems to have altered completely, while further observations made at the Laws Observatory during 1906 and 1907 indicate that the curve has again changed its form. This object then presents an unsolved problem similar to that presented in the cases of R Sagittae and V Vulpeculae.

PHOTOMETRIC OBSERVATIONS OF SHORT-PERIOD VARIABLE STARS.—No. 4247 of the *Astronomische Nachrichten* (p. 369, May 8) contains a series of results of the observations of twenty-nine variable stars of short period obtained by Herr H. v. Zeipel at the Upsala Observatory during 1907. For each star two comparison stars were employed, and their positions and magnitudes are given at the head of each table.

THE RELATIVE ACCURACY OF VARIOUS DOUBLE-STAR OBSERVERS.—A short paper by Herr V. Ehrenfeucht, appearing in No. 4247 of the *Astronomische Nachrichten* (p. 381, May 8), deals with the relative accuracy of the principal double-star observers. The resulting figures were obtained by comparing the measures of these observers with the ephemerides of fifty-two well-known doubles, and the probable errors in position-angle and distance are given for eleven observers. The errors in distance range from 0".055, for Schiaparelli, to 0".100, for Mädler, the mean value for all the observers considered being 0".698.

ITALIAN OBSERVATIONS OF THE SUN DURING 1907.—The usual summary, by Prof. Ricci, of the observations of spots, faculae, and prominences made at Catania during last year, appears in No. 3, vol. xxxvii., of the *Memorie della Società degli Spettroscopisti Italiani*.

The present paper deals especially with the second semestre of 1907, but the values for the whole year are given. For the period July to December the mean daily frequencies of spots, faculae, and prominences were 5.7, 2.1, and 4.7 respectively, whilst for the whole year the corresponding values were 5.5, 3.4, and 4.3.

THE NATAL OBSERVATORY.—Mr. Nevill's report of the work done at the Natal Observatory during 1907 is, as usual, chiefly devoted to the meteorological results obtained at the various meteorological stations of the colony. The only astronomical note of general interest is that a series of observations of comet 1907d was made by Mr. A. E. Hodgson, and the results are to be communicated to the Royal Astronomical Society. The magnetic declination at Durban for January 1, 1908, is given as $22^{\circ} 27' W.$, with a yearly decrease of $12'$, and the present value of the dip is $63^{\circ}.2$.

SOLAR PHENOMENA AND TERRESTRIAL TEMPERATURES.—In a paper published in the *Bulletin de la Société astronomique de France* for May, Dr. J. Loisel discusses the relationships between the activity of various solar phenomena and the amount of heat received at the earth's surface. The results are based on the observations made at Montpellier during the period 1883–1901, and are of such interest as to suggest the desirability of prosecuting this research in many more different localities. Plotting the actinometric results obtained at Montpellier, together with the frequency curves for sun-spots, faculae, and prominences, Dr. Loisel shows that they are distinctly analogous, but the terrestrial variation is an inversion of the solar variations.

THE OKAPI MONOGRAPH.¹

SHORTLY after the arrival in London of the first complete skin of the okapi, the administration of the Congo Free State at Brussels sent urgent orders to its officials on the Uganda border to procure other skins, and also skeletons, of the then newly discovered animal. In due course these orders were carried out, and a representative series of specimens received at the Museum of the Free State at Tervueren, a few miles out of Brussels,

¹ "Contribution à la Faune du Congo." Vol. i., Okapia. By Julien Fraipont. Pp. 118; 38 plates. *Annales du Musée du Congo. Zoologie*, ser. 2. (Brussels, 1907.)

some of which were mounted for public exhibition, while others were reserved for study. With commendable promptitude, the administration thereupon took steps to arrange for a monograph of the okapi, the preparation of which was entrusted in 1902 to Dr. Forsyth Major, who had already made a special study of the giraffe group.

During the same year, that gentleman visited Belgium for the purpose of studying the Tervueren specimens, upon which he published several preliminary notes in *La Belgique Coloniale*. Coloured and other plates for the monograph were also prepared under his direction. Nevertheless, after something like two years' delay, no MS. was forthcoming, and the Secretary of the Free State felt himself compelled to seek another author. Accordingly, Prof. Julien Fraipont was approached, who, after some demur, eventually consented, at the close of 1905, to undertake the work, and to use, so far as practicable, the plates prepared under Dr. Major's direction.

The result of these negotiations is the present elaborate and richly illustrated monograph, which bears on every page testimony to the author's diligence and industry. In one respect the delay has been of very considerable advantage, since it has admitted of the examination and comparison of a much larger series of specimens than was available in 1902–3. Most of these, it should be mentioned, originally belonged to the authorities of the Free State, by whom examples have been presented to the museums of Stockholm, Lisbon, Paris, Madrid, and Antwerp. Altogether, the author had at his disposal no fewer than a dozen skins, seven skeletons, and eleven skulls. With such full material, the monograph could scarcely fail to be otherwise than in a great degree exhaustive.

Following the usual rule, the monograph opens with a historical sketch of the discovery of the okapi and the subsequent acquisition of fuller knowledge of its structure and affinities. In the course of this chapter the author discusses the identification of the okapi with "Set-Typhon" of the ancient Egyptian frescoes and sculptures—an identification which he refuses to admit. The idea is, however, by no means dead, a special work on the subject having been published in Paris last year.

The next chapter is devoted to the general external form and colouring of the creature, in the course of which the author expresses his opinion that, if we except the zebra-like pattern on the limbs and the general brilliance of tone (rather a large order, by the way), the coloration is not unlike that of many antelopes. Of great interest are a number of figures of the limbs of different individuals to display individual variation in the matter of colour-pattern. The skeleton forms the subject of the following chapter, in the course of which the author devotes particular attention to the nature of the horns of the giraffe and okapi, and their correspondence with those of other ruminants. The "vellicorn," or skin-covered, type presented by the former is evidently the most primitive, and there can be equally little doubt that the cap of bare bone at the tip of the okapi's horn represents the deer's antler. A further inference from the latter identification is that the shedding of the antlers in deer is an acquired character, and it is noteworthy that some Tertiary stags seem to have permanent antlers, while in several of the less specialised living species, such as the Indian sambar, the shedding does not take place annually. Front views of a male and a female skull are given, although little is said with regard to individual variation in skull-width, of which we believe there is a good deal. In mentioning the existence of a double bicipital groove to the humerus, the author scarcely gives sufficient emphasis to the fact that this feature is absolutely distinctive of the Giraffidae.

With regard to the habits of the okapi, Prof. Fraipont has, of course, nothing new to relate, but the photographs he gives of the equatorial forest seem to confirm the suggestion that the striping of the limbs and hind-quarters serves the purpose of breaking up the outline of the creature in the comparatively clear basal zone of the forest. Copious extracts are given from the writings of those who have obtained more or less nearly accurate information with regard to the okapi's haunts and mode of life.

A casual survey of the four coloured plates included among the illustrations will probably lead to the belief